

SEUNGYEON KIM

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<https://seungyeon-k.github.io>

RESEARCH INTERESTS

- Vision-based prehensile and non-prehensile robotic object manipulation
- 3D object shape recognition from partially observed vision sensor data
- Group equivariant neural network models

EDUCATION

Seoul National University <i>Ph. D. in Mechanical Engineering</i> Advisor: Frank C. Park Thesis: Learning for Vision-Based Object Manipulation: A Shape Recognition-Based Approach Honors: <i>Outstanding Doctoral Dissertation Award</i>	<i>Sep 2019 - Feb 2024</i> <i>GPA: 4.15 / 4.3</i>
Seoul National University <i>M. S. in Mechanical Engineering</i> Advisor: Frank C. Park / work closely with Sang-Hoon Yeo Thesis: On the Encoding Capacity of Human Motor Adaptation	<i>Mar 2017 - Feb 2019</i> <i>GPA: 4.22 / 4.3</i>
Seoul National University <i>B.S. in Mechanical Engineering, Minor in Economics</i> Honors: <i>Summa Cum Laude</i>	<i>Mar 2013 - Feb 2017</i> <i>GPA: 3.91 / 4.3 (Major 4.02 / 4.3)</i>
Gyeonggibuk Science High School One-year early graduation	<i>Mar 2011 - Feb 2013</i>

EXPERIENCE

Robotics Laboratory, Seoul National University BK21 Postdoctoral Research Fellow	<i>May 2024 - Apr 2025</i>
Institute of Advanced Machines and Design (IAMD) Researcher in Intelligent Machine System Research Department	<i>Sep 2021 - Apr 2024</i>
Institute of Advanced Machines and Design (IAMD) Assistant Researcher in Intelligent Machine System Research Department	<i>Apr 2019 - Aug 2019</i>

PUBLICATIONS

- [C4] Leveraging 3D Reconstruction for Mechanical Search on Cluttered Shelves
Seungyeon Kim*, Young Hun Kim*, Yonghyeon Lee, Frank C. Park
Conference on Robot Learning (CoRL), 2023
- [C3] Equivariant Motion Manifold Primitives
Byeongho Lee*, Yonghyeon Lee*, **Seungyeon Kim**, MinJun Son, Frank C. Park
Conference on Robot Learning (CoRL), 2023
- [C2] SE(2)-Equivariant Pushing Dynamics Models for Tabletop Object Manipulations
Seungyeon Kim, Byeongdo Lim, Yonghyeon Lee, Frank C. Park
Conference on Robot Learning (CoRL), **Oral presentation (33/504 = 6.5%)**, 2022

- [J2] DSQNet: A Deformable Model-Based Supervised Learning Algorithm for Grasping Unknown Occluded Objects
Seungyeon Kim*, Taegyun Ahn*, Yonghyeon Lee, Jihwan Kim, Michael Y. Wang, Frank C. Park
 IEEE Transactions on Automation Science and Engineering (T-ASE), 2022
- [C1] A Statistical Manifold Framework for Point Cloud Data
 Yonghyeon Lee*, **Seungyeon Kim***, Jinwon Choi, Frank C. Park
 International Conference on Machine Learning (ICML), 2022
- [J1] On the Encoding Capacity of Human Motor Adaptation
Seungyeon Kim, Jaewoon Kwon, Jin-Min Kim, Frank C. Park, Sang-Hoon Yeo
 Journal of Neurophysiology (JNP), 2021

PROJECTS

- Object Grasping and Manipulation Skills for Stable Housekeeping Service** *Sep 2021 - Oct 2022*
Project Leader with Samsung Research
 • Develop prehensile and non-prehensile manipulation skills for handling various tableware objects on the table, as part of household tasks [C2].
- Deep Learning-based Lane Detection Algorithm from LiDAR data** *Apr 2021 - Oct 2021*
Project Leader with Seoul Robotics
 • Develop a deep neural network architecture that recognizes 3D lane information from LiDAR data.
- Artificial Intelligence-based Automated Painting Robot System** *Oct 2020 - Sep 2021*
Project Member with Doolim-Yaskawa
 • Develop an artificial intelligence-based smart painting robot automation system for automobile factories, primarily responsible for visualizing painting results.
- Babymind: Infant-Mimic Neurocognitive Developmental Machine Learning** *Apr 2019 - Dec 2020*
Project Leader with SNU-AIIS
 • Build infant-mimicking neurocognitive AI technologies for robot manipulation in real-world environments. Conduct research on human motion primitives [J1] and baby-inspired grasping skills [J2].
- Deep Reinforcement Learning Algorithm for Industrial Robot** *Apr 2018 - Dec 2018*
Project Leader with Samsung Electronics
 • Develop a safe and efficient reinforcement learning algorithm for high-gain position controller-based industrial robots.

TEACHING EXPERIENCE

- Geometric Methods for High-Dimensional Data Analysis (M3239.006800)** *Fall 2022*
 Teaching Assistant in Seoul National University
- Dynamics (446.204A)** *Fall 2018*
 Teaching Assistant in Seoul National University
- Introduction to Robotics (M2794.0027)** *Spring 2017*
 Teaching Assistant in Seoul National University
- Basic Calculus 1 (033.016)** *Spring 2015*
 Undergraduate Student Instructor in Seoul National University
- Basic Calculus 2 (033.017)** *Fall 2014*
 Undergraduate Student Instructor in Seoul National University